REMARKS/ARGUMENTS

The claims are 2, 9-11, 13-14, 17-19, 22-49. Claims 2, 9-11, 13-14, 17, 19, and 22-23 have been amended to improve their form or to better define the invention. In addition, claims 6, 12, 15, 20 and 21 have been cancelled and new claims 24-49 have been added. The Specification has been amended to delete reference to the claims. Support for the claims may be found, *inter alia,* in the disclosure on page 3, first full paragraph, on page 4 last full paragraph, in the paragraph bridging pages 4-5, on page 7 last full paragraph, in the paragraph bridging pages 11-12, in the first full paragraph on page 12, in the paragraph bridging pages 13-14, in FIG. 5 and in the original claims. Reconsideration is respectfully requested.

Claims 17, 2, 6 and 15 were rejected under U.S.C. 102 (b) as being anticipated by *Ohkubo et al. U.S. Patent No. 5,862,240.* The remaining claims were rejected under under U.S.C. 103(a) as being unpatentable over *Ohkubo et al.* in view of newly cited *U.S. Patent No. 5,561,737* to *Bowen* (claims 19 and 9), or newly cited *U.S. Patent No. 5,526,433 to Zakarauskas et al.* (claims 10, 11, 12, and 21), or *Zakarauskas et al.* and *Sibbald et al. U.S. Patent No. 5,600,727* (claims 13 and 14), or *Kaneda et al. U.S. Patent*

No. 4,536,887 (claim 18), or *Zakarauskas et al.* and *Kaneda et al.* (claim 20), or *Kaneda* and *Zakarauskas et al.* (claims 22 and 23). Essentially, the Examiner's position was that *Ohkubo et al.* discloses the sound recording device recited in the claims except for features which are disclosed by the secondary references to *Bowen, Zakarauskas et al., Sibbald et al.* and *Kaneda et al.*

This rejection is respectfully traversed.

As set forth in claims 17 and 19, as amended, and in new claim 24, Applicant's invention provides a sound pick up device for a public address system including at least two acoustic sensors for simultaneously picking up sound emitted from a sound source and converting into electrical signals, and a common signal amplitude add device electrically or acoustically connected to the acoustic sensors. The acoustic sensors have directional characteristics and are oriented so that the axes of their main reception direction are directed towards a reference position within a useful zone. The add device combines the electrical signals received from all the acoustic sensors.

As more specifically recited in claims 17 and 19, as amended, the sound pick up device includes delay elements associated with individual ones or all of the acoustic sensors, the delay elements equalizing acoustic transmission times from the sound source to the acoustic sensors.

As recited in amended claim 17, moreover, the delay elements have a delay time controlled by automatic position detection of a sound source and only the delay time of the delay elements is automatically adjusted individually with respect to each acoustic sensor to a modification of the actual position of the sound source without adjusting the arrangement of the acoustic sensors or their main reception directions.

As recited in new claim 24, the acoustic sensors are arranged with the same spacing from the reference position whereas in claims 17 and 19, as amended, the acoustic sensors are arranged with differing spacing to the reference position.

The primary reference *Ohkubo et al.* fails to disclose or suggest the sound pick up device recited in claim 17, 19 or 24. Although the Examiner has taken the position that *Ohkubo*

discloses delay elements associated with individual acoustic sensors because in the Examiners view it is inherent that the signal from microphones have a delay, it is respectfully submitted that there is no disclosure or suggestion in *Ohkubo* of delay elements associated with individual ones or all of the acoustic sensors where the delay elements equalize acoustic transmission times from the sound source of the acoustic sensors as recited in claims 17 and 19 as amended.

Morever, it is respectfully submitted that there is no disclosure or suggestion in *Ohkubo et al.* of the sound or pick up device as recited in claim 24 in which the acoustic sensors are arranged with the same spacing from the reference position in combination with a common signal amplitude add device, electrically or acoustically connected to the acoustic sensors to combine the electric signals received from all the acoustic sensors. It is respectfully submitted that this combination is neither disclosed in *Ohkubo et al.'s* description nor covered by any of their claims. It is respectfully submitted, moreover, that there is nothing in *Ohkubo et al.* to indicate that they appreciated that with directional microphones directed to a common point and the outputs added, the energy received from the

sound source is the maximum possible, and in fact this feature of Applicant's sound pick up device is in contrast to what *Ohkubo et al.* seek in any of their claims.

The defects and deficiencies of the primary reference to *Ohkubo et al.* are in no way remedied by any of the secondary references to *Bowen*, *Zakarauskas et al.*, *Sibbald et al.* and *Kaneda et al.* *Bowen* discloses an automatic switching system for microphone signals which is based on a voting algorithm to select for activation the appropriate microphone and a weighting factor for gradually turning on or off the signal from each activated microphone. In contrast, Applicant's sound pickup devices recited in amended claims 17, 19 and in new claim 24 do not use any such algorithm or weighting factor. For example, Applicant's algorithms use time differences not amplitude differences, for instance, by a correlator. See claims 13, 14, 22, 23, 26, 27, 39, 40 and 41.

In addition as recited in claims 17 and 19, as amended, and in new claim 24, Applicant's sound pickup device includes at least two acoustic sensors for simultaneously picking up sound emitted from a sound source and converting into electrical

signals. Thus in Applicant's sound pickup device, the different microphones are not switched on alternatively but rather all of the microphones pick up sound simultaneously. Moreover, *Bowen* is directed to microphones arranged in a circular enclosure arranged in a conference array configuration with response patterns aimed outwardly from the center of the enclosure. In contrast, in Applicant's sound pickup device as recited in claims 17 and 19, as amended, and in new claim 24, the acoustic sensors are oriented so that the axis of their main reception directions are directed towards a reference position within the useful zone. Thus, all microphones direct to the same point.

Zakarauskas et al. discloses a directional microphone (shotgun type or with a parabolic reflector) which is automatically directed to a sound source which is being identified among other sound sources. There are extra auxiliary microphones arranged on the periphery of the reflector with their electrical outputs totally separated from the audio signal output of the directional microphone and which are used for determining the time differences of the sound received from the separated sound source.

In contrast to Applicant's sound pickup devices recited in claims 17 and 19, as amended, and in new claim 24, no microphone output signals are added, neither those of the auxiliary nor microphones or any ordinary signals. The auxiliary microphones of *Zakarauskas et al.* are omnidirectional types which consequently cannot be directed towards a sound source or to a common point whereas Applicant's sound pick up device as recited in amended claims 17, 19 and in new claim 24 uses acoustic sensors having directional characteristics which are directed to the same point.

Moreover, *Zakarauskas et al.* does not use the audio signal for determining the position of the sound source which is fundamentally different from Applicant's sound pickup device. *Zakarauskas et al.* discloses extra auxiliary microphones reducing narrow peaks in the frequency band which is absolutely unsuitable for sound transmission. Although, *Zakarauskas et al.'s* system swivels a microphone by calculating the desired direction from the time-of-flight differences of the sound to different microphones, it is respectfully submitted that there is no disclosure or suggestion of Applicant's sound pickup device wherein the same microphones are used for the audio signal and

for the calculation of the position. Rather, *Zakarauskas et al.* is directed to a particular arrangement with extra auxiliary microphones for swiveling the audio microphones (not the microphones for which the position is calculated).

Moreover, as more specifically recited in claims 25, 36 and 44, Applicant's sound pickup device includes a control device which sends commands for individually adjusting the axes of the main reception directions of the acoustic sensors in response to automatic position detection of the sound source without mechanical displacement or pivoting of the acoustic sensors. This feature is completely different from anything that's disclosed in *Zakarauskas et al.*

Moreover, it should be noted that the displacement of *Zakarauskas et al.* is based on extra sound receivers which are separated from the main signal; however, there is no disclosure or suggestion in *Zakarauskas et al.* of equal spacing as recited in new claim 24. Thus, it is respectfully submitted that neither Ohkubo et al nor *Zakarauskas et al* discloses equal spacing; however even if *Ohkubo et al.* is considered to disclose equal spacing, it is respectfully submitted that to modify *Ohkubo et*

al. with anything from *Zakarauskas et al.* is contrary to the asserted equal spacing arrangement of *Ohkubo et al.* as proposed by the Examiner.

With respect to *Sibbald et al.*, which has been cited with respect to claims 13 and 14, it is respectfully submitted that there is no disclosure or suggestion of position determination in the manner set forth in Applicant's claims. Rather, *Sibbald et al.* undertakes a position determination in a completely different manner using loud speakers signals for identifying a reference position. In contrast, in Applicant's claimed system, loud speakers are not used at all.

In contrast to *Sibbald et al.* Applicant's invention as recited in claims 13 and 14 requires no additional signal generators and does not determine the positions of a plurality of (occasionally individually moving) microphones with respect to a known reference position. In contrast to *Sibbald et al.* Applicant's microphones are always at known positions, and Applicant's device determines the actual (constantly moving) position of a sound source with respect to the position of the

microphones. See also Applicant's discussion of *Sibbald et al.* in its Amendment filed September 8, 2005.

Kaneda et al fails to disclose or suggest a sound pickup device that includes delay elements associated with individual ones or all of the acoustic sensors that equalize acoustic transmission times of the sound source to the acoustic sensors, as recited in claims 17 and 19, as amended. Although *Kaneda et al.* shows delay elements, they do not act as compensations for the times-of-flight. *Kaneda et al.* itself makes this difference clear by detecting a particular signal out of the acoustic field through the elimination of all the other signals and noise. In contrast, Applicant's sound pickup device does not extract a particular signal out of multiple signals by using an array of microphones. Rather, Applicant's sound pickup device transmits the complete signal by adding the signals of all the microphones resulting from all sources located in a zone of reception.

Moreover, *Kaneda et al.* delay units and delay times are fixed and not correlated with acoustic transition times from the sound source to acoustic sensors. It is respectfully submitted that the Examiners suggestion that *Kaneda et al.*'s delay units

compensate different acoustic transmission times from the sound source to acoustic sensors is incorrect. The delay units of *Kaneda et al.* are not capable of synchronizing the phase of the different audio signals because they have fixed delay times without any respect to the actual position of the sound source. *Kaneda et al.* manipulates the audio signal by means of control unit 5 which Applicant's sound pickup device as recited in amended claims 17 and 19 and in new claim 24 does not do at all.

Accordingly, it is respectfully submitted that Applicant's invention as recited in claims 17 and 19, as amended, and in new claim 24, and in dependent claims 2, 9-11, 13-14, 18, 22, 23, and 25-49, are patentable over the cited references.

In summary, claims 6, 12, 15, 20 and 21 have been cancelled, claims 2, 9-11, 13-14, 17, 19 and 22-23 have been amended, and new claims 24-49 have been added. The Specification has also been amended. A check for $ 425.00 is enclosed in payment of the excess claim fees for seventeen (17) additional claims in excess of twenty (20) claims. In view of the foregoing, it is respectfully requested that the claims be allowed and this application be passed to issue.

Respectfully submitted,
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Enclosure(s): Check in the amount of $425.00, copy of Petition for Three (3) Month Extension of Time

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 5, 2006.

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